

DETERGENT COSMETIC COMPOSITIONS AND USE

The present invention relates to novel cosmetic compositions with improved properties intended simultaneously for cleaning and conditioning the hair and comprising, in a cosmetically acceptable vehicle, a washing base composed of surfactants with a detergent power, in which base are also present, as conditioning agents, cationic polymers in combination with a specific amine-comprising silicone. The invention also relates to the use of the said compositions in the abovementioned cosmetic application.

The use of detergent compositions (or shampoos) based essentially on conventional surface-active agents of, in particular, anionic, non-ionic and/or amphoteric type but more particularly of anionic type is commonplace in the cleaning and/or washing of hair. These compositions are applied to wet hair and the foam generated by massaging or rubbing with the hands makes it possible, after rinsing with water, to remove the varied dirt initially present in the hair.

These base compositions certainly possess a good washing power but the intrinsic cosmetic properties which are attached thereto however remain fairly weak, in particular due to the fact that the relatively aggressive nature of such a cleaning treatment can in the long term cause more or less marked damage to the capillary fibre, related in

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particular to the gradual removal of the lipids or proteins present in or at the surface of the latter.

Thus, in order to improve the cosmetic properties of the above detergent compositions and more particularly of those which are required to be applied to sensitive hair (i.e. hair which is damaged or embrittled, in particular under the chemical action of atmospheric agents and/or of hair treatments, such as permanent waves, dyeings or bleachings), it is now usual to introduce, into the latter, additional cosmetic agents, known as conditioning agents, intended mainly to repair or restrict the harmful or undesirable effects induced by the various treatments or attacks which capillary fibres are more or less repeatedly subjected to. These conditioning agents can, of course, also improve the cosmetic behaviour of natural hair.

The conditioning agents which are most commonly used currently in shampoos are cationic polymers, silicones and/or silicone derivatives, because these confer, on washed, dry or wet hair, an ease of disentangling, a softness and a sleekness which are increased with respect to that which can be obtained with the corresponding cleaning compositions which are devoid of them. In addition, it is known to preferably use a mixture of silicone and of cationic polymer on sensitive hair.

However, and despite the progress recently made in the field of shampoos based on cationic

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polymers and on silicone, these are not really completely satisfactory.

This is because the abovementioned cosmetic advantages are unfortunately also accompanied, on dried hair, by certain cosmetic effects which are considered to be undesirable, namely lankness of the hairstyle (lack of lightness of the hair), lack of sleekness (individual hair nonhomogeneous from the root to the tip) and insufficient sheen.

10 In addition, the use of cationic polymers for this purpose exhibits various disadvantages. Due to their strong affinity for hair, some of these polymers are deposited to a significant extent during repeated use and result in undesirable effects, such as an
15 unpleasant and heavy feel, stiffening of the hair and interfibre adhesion, affecting the styling. These disadvantages are accentuated in the case of fine hair, which lacks liveliness and body.

Thus, a strong need still currently exists
20 with regard to being able to have available novel products exhibiting a better performance with regard to one or more of the cosmetic properties mentioned above.

The present invention is targeted at overcoming these disadvantages.

25 Thus, following significant research carried out on the subject, it has now been found by the Applicant Company, entirely unexpectedly and surprisingly, that by using a specific and suitably

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selected amine-comprising silicone as defined below in
detergent compositions comprising conventional cationic
polymers as conditioning agents, it is possible to
limit, indeed even eliminate, the problems generally
5 related to the use of such compositions, namely, in
particular, lankness and lack of sleekness and of
softness of the hair, while retaining the other
advantageous cosmetic properties which are attached to
compositions based on conditioning agents, in
10 particular their good intrinsic washing power.

The compositions in accordance with the
invention confer on hair, after rinsing, a notable
treating effect which is expressed in particular by an
ease of disentangling as well as a contribution of
15 body, of lightness, of sleekness, of softness and of
suppleness.

All these discoveries form the basis of the
present invention.

Thus, according to the present invention,
20 novel detergent and conditioning compositions are now
provided comprising, in a cosmetically acceptable
medium, (A) a washing base and (B) a conditioning
system comprising at least one cationic polymer and at
least one amine-comprising silicone with a weight-
25 average molecular mass of between 11,000 and 25,000.

Another subject-matter of the invention is
the use in cosmetics of the above compositions for

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cleaning and conditioning keratinous substances, in particular the hair.

However, other characteristics, aspects and advantages of the invention will become still more
5 clearly apparent on reading the description which follows and the concrete but in no way limiting examples intended to illustrate it.

As indicated above, the essential components entering into the composition of the products according
10 to the invention are (A) a washing base and (B) a conditioning system comprising (i) the cationic polymer or polymers and (ii) the specific amine-comprising silicone or silicones.

15 A - WASHING BASE:

The compositions in accordance with the invention necessarily comprise a washing base, generally an aqueous washing base.

The surfactant or surfactants forming the
20 washing base can be chosen without distinction, alone or as mixtures, from anionic, amphoteric, non-ionic, zwitterionic and cationic surfactants.

However, according to the invention, the washing base preferably comprises anionic surfactants
25 or mixtures of anionic surfactants and of amphoteric surfactants and, more preferentially still, comprises only this type of surfactant or mixture of surfactants.

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The minimum amount of washing base is that just sufficient to confer a satisfactory foaming and/or detergent power on the final composition, and excessively large amounts of washing base do not really
5 contribute additional advantages.

Thus, according to the invention, the washing base can represent from 4% to 50% by weight, preferably from 8% to 35% by weight and more preferentially still from 10% to 25% by weight of the total weight of the
10 final composition.

The surfactants which are suitable for implementing the present invention are in particular the following:

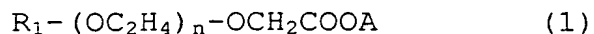
(i) Anionic surfactant(s):

15 Their nature does not assume a really critical character within the context of the present invention.

Thus, by way of example of anionic surfactants that can be used, alone or [lacuna]
20 mixtures, in the context of the present invention, there may be mentioned in particular (non-limiting list) the salts (in particular alkali metal, especially sodium, salts, ammonium salts, amine salts, aminoalcohol salts or magnesium salts) of the following
25 compounds: alkyl sulphates, alkyl ether sulphates, alkylamido ether sulphates, alkylarylpolyether sulphates, monoglyceride sulphates; alkylsulphonates, alkyl phosphates, alkylamidesulphonates, alkylaryl-

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sulphonates, α -olefinsulphonates, paraffinsulphonates;
 alkyl sulphosuccinates, alkyl ether sulphosuccinates,
 alkylamidesulphosuccinates; alkyl sulphosuccinamates;
 alkyl sulphoacetates; alkyl ether phosphates;
 5 acylsarcosinates; acylisethionates and N-acyltaurates,
 the alkyl or acyl radical of all these different
 compounds preferably comprising from 12 to 20 carbon
 atoms, and the aryl radical preferably denoting a
 phenyl or benzyl group. Among the anionic surfactants
 10 which are further usable, there may also be mentioned
 the salts of fatty acids, such as the salts of oleic,
 ricinoleic, palmitic and stearic acids, the acids of
 copra oil or of hydrogenated copra oil, and
 acyllactylates in which the acyl radical comprises 8 to
 15 20 carbon atoms. It is also possible to use weakly
 anionic surfactants, like alkyl-D-galactosideuronic
 acids and salts thereof, as well as polyoxyalkylenated
 ether carboxylic acids and salts thereof, in particular
 those comprising from 2 to 50 ethylene oxide groups,
 20 and mixtures thereof. The anionic surfactants of the
 polyoxyalkylenated ether carboxylic acid or salt type
 are in particular those which correspond to the
 following formula (1):



25 in which:

R_1 denotes an alkyl or alkaryl group and n is an integer
 or decimal number (mean value) which can vary from 2 to
 24 and preferably from 3 to 10, the alkyl radical

having between 6 and 20 carbon atoms approximately and aryl preferably denoting phenyl,

A denotes H, ammonium, Na, K, Li, Mg or a monoethanolamine or triethanolamine residue. Use may
5 also be made of mixtures of compounds of formula (1), in particular mixtures in which the R_1 groups are different.

Among the anionic surfactants, it is preferable to use, according to the invention, alkyl
10 sulphate and alkyl ether sulphate salts and mixtures thereof.

(ii) Non-ionic surfactant(s):

The non-ionic surface-active agents themselves are also compounds which are well known per
15 se (in this respect see in particular the "Handbook of Surfactants" by M.R. Porter, published by Blackie & Son (Glasgow and London), 1991, pp. 116-178) and, in the context of the present invention, their nature does not assume any critical character. They can thus be chosen
20 especially from (non-limiting list) fatty alcohols, alpha-diols, alkylphenols or acids which are polyethoxylated, polypropoxylated or polyglycerolated, having a fatty chain comprising, for example, 8 to 18 carbon atoms, it being possible for the number of
25 ethylene oxide or propylene oxide groups to range especially from 2 to 50 and it being possible for the number of glycerol groups to range especially from 2 to 30. Mention may also be made of the copolymers of

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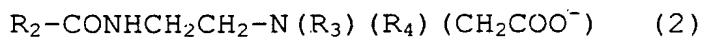
ethylene and propylene oxide and the condensates of
ethylene and propylene oxide with fatty alcohols; the
polyethoxylated fatty amides preferably having from 2
to 30 mol of ethylene oxide, the polyglycerolated fatty
5 amides on average comprising 1 to 5 glycerol groups and
in particular 1.5 to 4; the polyethoxylated fatty
amines preferably having 2 to 30 mol of ethylene oxide;
the oxyethylenated esters of sorbitan fatty acids
having from 2 to 30 mol of ethylene oxide; the sucrose
10 esters of fatty acids, the polyethylene glycol esters
of fatty acids, alkylpolyglycosides, the
N-alkylglucamine derivatives, or amine oxides, such as
the oxides of (C₁₀-C₁₄)alkylamines or the N-acylamino-
propylmorpholine oxides. It will be noted that
15 alkylpolyglycosides constitute non-ionic surfactants
which enter particularly well into the scope of the
present invention.

(iii) Amphoteric or zwitterionic
surfactant(s):

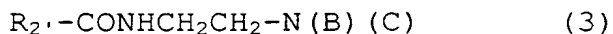
20 The amphoteric or zwitterionic surface-active
agents, the nature of which does not assume any
critical character in the context of the present
invention, may be especially (non-limiting list)
derivatives of aliphatic secondary or tertiary amines
25 in which the aliphatic radical is a linear or branched
chain comprising 8 to 18 carbon atoms and comprising at
least one water-solubilizing anionic group (for example
carboxylate, sulphonate, sulphate, phosphate or

phosphonate); (C₈-C₂₀)alkyl betaines, sulphobetaines, (C₈-C₂₀)alkyl amido(C₁-C₆)alkyl betaines or (C₈-C₂₀)alkyl amido(C₁-C₆)alkyl sulphobetaines may further be mentioned.

- 5 Among the amine derivatives, there may be mentioned products sold under the name Miranol, as described in Patents US-2,528,378 and US-2,781,354 and classified in the CTFA dictionary, 3rd edition, 1982, under the names Amphocarboxyglycinates and
- 10 Amphocarboxypropionates with respective structures:



- in which: R₂ denotes an alkyl radical of an acid R₂-COOH present in hydrolysed copra oil, a heptyl, nonyl or
- 15 undecyl radical, R₃ denotes a beta-hydroxyethyl group and R₄ a carboxymethyl group;
- and



- 20 in which:

B represents -CH₂CH₂OX', C represents -(CH₂)_z-Y', with z = 1 or 2,

X' denotes the -CH₂CH₂-COOH group or a hydrogen atom

- 25 Y' denotes -COOH or the radical -CH₂-CHOH-SO₃H

R₂' denotes an alkyl radical of an acid R₂'-COOH present in copra oil or in hydrolysed linseed oil, an alkyl

radical, in particular C₇, C₉, C₁₁ or C₁₃, a C₁₇ alkyl radical and its iso form or an unsaturated radical C₁₇.

By way of example, there may be mentioned the cocoamphocarboxyglycinate sold under the trade name

5 Miranol C2M concentrated by the Company Miranol.

(iv) Cationic surfactants:

Among the cationic surfactants, there may be mentioned in particular (non-limiting list): the salts of optionally polyoxyalkylenated primary, secondary or
10 tertiary fatty amines; quaternary ammonium salts, such as tetraalkylammonium, alkylamidoalkyltrialkylammonium, trialkylbenzylammonium, trialkylhydroxyalkylammonium or alkylpyridinium chlorides or bromides; imidazoline derivatives; or amine oxides of cationic nature.

15 It will be noted that the cationic surfactants, the use of which is not ruled out, do not constitute preferred surfactants for making use of the present invention.

B - CONDITIONING SYSTEM

20

(i) Cationic polymer(s)

The compositions according to the invention, in addition, necessarily comprise a cationic polymer.

The conditioning agents of cationic polymer
25 type which can be used in accordance with the present invention can be chosen from all those already known per se as improving the cosmetic properties of hair treated with detergent compositions, namely, in

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particular, those disclosed in Patent Application EP-A 0,337,354 and in French Patent Applications FR-A-2,270,846, 2,383,660, 2,598,611, 2,470,596 and 2,519,863.

5 More generally still, within the meaning of the present invention, the expression "cationic polymer" denotes any polymer comprising cationic groups and/or groups which can be ionized to cationic groups.

10 The preferred cationic polymers are chosen from those which comprise units comprising primary, secondary, tertiary and/or quaternary amine groups, which can either form part of the main polymer chain or be carried by a side substituent directly connected to the latter.

15 The cationic polymers used generally have a number [lacuna] molecular mass of between 500 and 5×10^6 approximately and preferably of between 10^3 and 3×10^6 approximately.

20 Mention may more particularly be made, among cationic polymers, of quaternized proteins (or protein hydrolysates) and polymers of the polyamine, polyaminoamide and poly(quaternary ammonium) type. These are known products.

25 The quaternized proteins or protein hydrolysates are in particular chemically modified polypeptides carrying quaternary ammonium groups at the chain end or grafted onto the chain. Their molecular mass can vary, for example, from 1500 to 10,000 and in

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- collagen hydrolysates carrying triethylammonium groups, such as the products sold under the name "Quat-Pro E" by the Company Maybrook and called, in the CTFA dictionary, "Triethonium Hydrolyzed Collagen Ethosulphate";

- animal protein hydrolysates carrying trimethylbenzylammonium groups, such as the products sold under the name "Crotein BTA" by the Company Croda and called, in the CTFA dictionary, "Benzyltrimonium Hydrolysed Animal Protein";

Mention may be made, among these protein hydrolysates, inter alia, of:

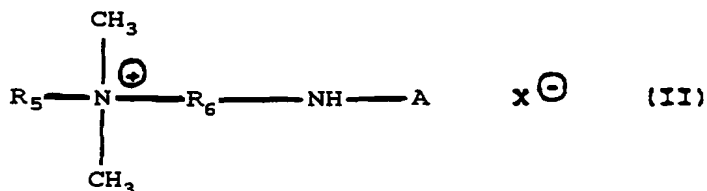
25 - "Croquat[®] M", the quaternary ammonium groups of which comprise C₁₀-C₁₈ alkyl groups;

- "Croquat[®] S", the quaternary ammonium groups of which comprise a C₁₈ alkyl group;

- "Crotein® Q", the quaternary ammonium groups of which comprise at least one alkyl group having from 1 to 18 carbon atoms.

These various products are sold by the
5 Company Croda.

Other quaternized proteins or hydrolysates are, for example, those corresponding to the formula:



in which X^- is an anion of an organic or inorganic acid,
10 A denotes a protein residue derived from collagen protein hydrolysates, R_5 denotes a lipophilic group comprising up to 30 carbon atoms and R_6 represents an alkylene group having 1 to 6 carbon atoms. Mention may be made, for example, of the products sold by the
15 Company Inolex under the name "Lexein® QX 3000", called "Cocotrimonium Collagen Hydrolysate" in the CTFA dictionary.

Mention may also be made of quaternized plant proteins, such as wheat, maize or soya proteins:
20 mention may be made, as quaternized wheat proteins, of those sold by the Company Croda under the names "Hydrotritricum WQ or QM", called "Cocodimonium Hydrolysed Wheat Protein" in the CTFA dictionary, "Hydrotritricum QL", called "Laurdimonium Hydrolysed
25 Wheat Protein" in the CTFA dictionary or "Hydrotritricum

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QS", called "Steardimonium Hydrolysed Wheat Protein" in the CTFA dictionary.

The polymers of the polyamine, polyamidoamide or poly(quaternary ammonium) type which can be used in accordance with the present invention which can be mentioned in particular are those disclosed in French Patents No. 2,505,348 or 2,542,997. Mention may be made, among these polymers, of:

(1) optionally quaternized vinylpyrrolidone/dialkyl-
10 aminoalkyl acrylate or methacrylate copolymers, such as
the products sold under the name "Gafquat" by the
Company ISP, such as, for example, Gafquat® 734, 755 or
HS100, or else the product "Copolymer 937". These
polymers are disclosed in detail in French Patents
15 2,077,143 and 2,393,573.

(2) cellulose ether derivatives comprising quaternary ammonium groups disclosed in French Patent 1,492,597 and in particular the polymers sold under the names "JR[®]" (JR[®] 400, JR[®] 125, JR[®] 30M) or "LR[®]" (LR[®] 400, LR[®] 30M) by the Company Union Carbide Corporation.

These polymers are also defined in the CTFA dictionary as quaternary ammoniums of hydroxyethylcellulose which has reacted with an epoxide substituted by a trimethylammonium group.

25. (3) cationic cellulose derivatives, such as the copolymers of cellulose or the cellulose derivatives grafted with a water-soluble quaternary ammonium monomer and disclosed in particular in Patent US

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4,131,576, such as hydroxyalkyl celluloses, for example hydroxymethyl-, hydroxyethyl- or hydroxypropyl celluloses, grafted in particular with a methacryloylethyltrimethylammonium, methacrylmido-
5 propyltrimethylammonium or diallyldimethylammonium salt.

The marketed products corresponding to this definition are more particularly the products sold under the name "Celquat® L 200" and "Celquat® H 100" by
10 the Company National Starch.

(4) the cationic polysaccharides disclosed more particularly in Patents US 3,589,578 and 4,031,307, such as guar gums comprising cationic trialkylammonium groups. Use is made, for example, of guar gum modified
15 by a 2,3-epoxypropyltrimethylammonium salt (for example, chloride).

Such products are sold in particular under the trade names of Jaguar® C13 S, Jaguar® C 15, Jaguar® C 17 or Jaguar® C162 by the Company Meyhall.

20 (5) polymers composed of piperazinyl units and of divalent, straight- or branched-chain alkylene or hydroxyalkylene radicals, optionally interrupted by oxygen, sulphur or nitrogen atoms or by aromatic or heterocyclic rings, as well as the oxidation and/or
25 quaternization products of these polymers. Such polymers are disclosed in particular in French Patents 2,162,025 and 2,280,361.

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- (6) water-soluble polyaminoamides prepared in particular by polycondensation of an acidic compound with a polyamine; these polyaminoamides can be crosslinked by an epihalohydrin, a diepoxide, a dianhydride, an unsaturated dianhydride, a bisunsaturated derivative, a bishalohydrin, a bisazetidinium, a bishaloacyldiamine or an alkyl bishalide or alternatively by an oligomer resulting from the reaction of a bifunctional compound reactive with respect to a bishalohydrin, a bisazetidinium, a bishaloacyldiamine, an alkyl bishalide, an epihalohydrin, a diepoxide or a bisunsaturated derivative; the crosslinking agent being used in proportions ranging from 0.025 to 0.35 mol per amine group of the polyaminoamide; these polyaminoamides can be alkylated or, if they comprise one or more tertiary amine functional groups, quaternized. Such polymers are disclosed in particular in French Patents 2,252,840 and 2,368,508.
- (7) polyaminoamide derivatives resulting from the condensation of polyalkylenepolyamines with polycarboxylic acids, followed by an alkylation by bifunctional agents. Mention may be made, for example, of adipic acid/diakylaminohydroxyalkyldialylenetriamine polymers in which the alkyl radical comprises from 1 to 4 carbon atoms and preferably denotes methyl, ethyl or propyl. Such polymers are disclosed in particular in French Patent 1,583,363.

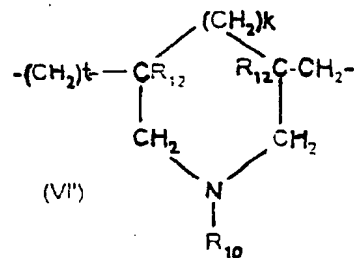
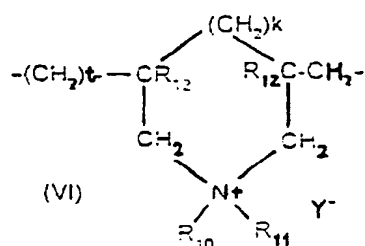
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Mention may more particularly be made, among these derivatives, of the adipic acid/dimethylamino-hydroxypropyl/diethylenetriamine polymers sold under the name "Cartaretine® F, F4 or F8" by the Company Sandoz.

(8) polymers obtained by reaction of a polyalkylene-polyamine comprising two primary amine groups and at least one secondary amine group with a dicarboxylic acid chosen from diglycolic acid and saturated aliphatic dicarboxylic acids having from 3 to 8 carbon atoms. The molar ratio of polyalkylenepolyamine to dicarboxylic acid being between 0.8:1 and 1.4:1; the polyaminoamide resulting therefrom being brought to react with epichlorohydrin in a molar ratio of epichlorohydrin in relation to the secondary amine group of the polyaminoamide of between 0.5:1 and 1.8:1. Such polymers are disclosed in particular in United States Patents 3,227,615 and 2,961,347.

Polymers of this type are in particular sold under the name "Hercosett® 57" by the Company Hercules Inc. or else under the name of "PD 170" or "Delsette® 101" by the Company Hercules in the case of the adipic acid/epoxypropyl/diethylenetriamine copolymer.

(9) cyclohomopolymers of methyldiallylamine or of dimethyldiallylammonium, such as the homopolymers or copolymers comprising, as main constituent of the chain, units corresponding to the formulae (VI) or (VI'):

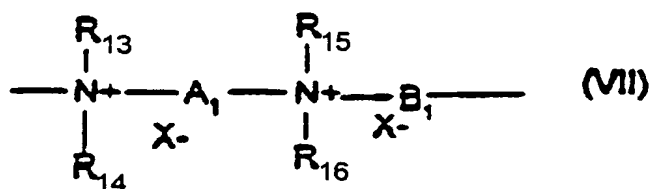


in which formulae k and t are equal to 0 or 1, the sum $k + t$ being equal to 1; R_{12} denotes a hydrogen atom or a methyl radical; R_{10} and R_{11} , independently of one

5 another, denote an alkyl group having from 1 to 22
carbon atoms, a hydroxyalkyl group in which the alkyl
group preferably has 1 to 5 carbon atoms or a lower
amidoalkyl group or R_{10} and R_{11} can denote, jointly with
the nitrogen atom to which they are attached,
10 heterocyclic group, such as piperidinyl or morpholinyl;
 Y^- is an anion, such as bromide, chloride, acetate,
borate, citrate, tartrate, bisulphate, bisulphite,
sulphate or phosphate. These polymers are disclosed in
particular in French Patent 2,080,759 and in its
15 Certificate of Addition 2,190,406.

Mention may more particularly be made, among the polymers defined above, of homopolymers of diallyldimethylammonium chloride with a number-average molecular mass (M_n) of between 5000 and 200,000 and more particularly with an M_n of between 6000 and 20,000.

(10) the quaternary diammonium polymer comprising repeat units corresponding to the formula:



in which formula (VII):

R₁₃, R₁₄, R₁₅ and R₁₆, which are identical or different, represent aliphatic, alicyclic or arylaliphatic

5 radicals comprising from 1 to 20 carbon atoms or lower hydroxyalkyl aliphatic radicals or else R₁₃, R₁₄, R₁₅ and R₁₆, together or separately, form, with the nitrogen atoms to which they are attached, heterocycles optionally comprising a second heteroatom other than

10 nitrogen or else R₁₃, R₁₄, R₁₅ and R₁₆ represent a linear or branched C₁₋₆ alkyl radical substituted by a nitrile, ester, acyl, amide or -CO-O-R₁₇-D or -CO-NH-R₁₇-D group, where R₁₇ is an alkylene and D a quaternary ammonium group;

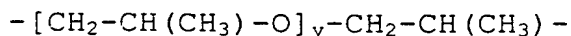
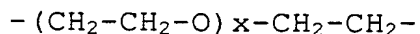
15 A₁ and B₁ represent polymethylene groups comprising from 2 to 20 carbon atoms which can be linear or branched and saturated or unsaturated, and which can comprise, bonded to or inserted into the main chain, one or more aromatic rings or one or more oxygen
20 or sulphur atoms or sulphoxide, sulphone, disulphide, amino, alkylamino, hydroxyl, quaternary ammonium, ureido, amide or ester groups, and

X⁻ denotes an anion derived from an inorganic or organic acid;

A₁, R₁₃ and R₁₅ can form, with the two nitrogen atoms to which they are attached, a piperazine ring; in addition, if A₁ denotes a linear or branched, saturated or unsaturated alkylene or hydroxyalkylene radical, B₁ can also denote a (CH₂)_n-CO-D-OC-(CH₂)_n- group

in which D denotes:

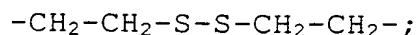
a) a glycol residue of formula: -O-Z-O-, where Z denotes a linear or branched hydrocarbon-comprising radical or a group corresponding to one of the following formulae:



where x and y denote an integer from 1 to 4, representing a defined and unique degree of polymerization, or any number from 1 to 4 representing a mean degree of polymerization;

b) a bis-secondary diamine residue, such as a piperazine derivative;

c) a bisprimary diamine residue of formula: -NH-Y-NH-, where Y denotes a linear or branched hydrocarbon-comprising radical or else the divalent radical

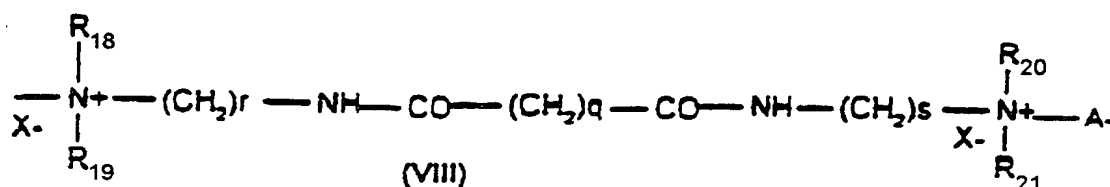


d) a ureylene group of formula: -NH-CO-NH-;
Preferably, X⁻ is an anion, such as chloride or bromide.

These polymers have a number-average molecular mass generally of between 1000 and 100,000.

Polymers of this type are disclosed in particular in French Patents 2,320,330, 2,270,846, 2,316,271, 2,336,434 and 2,413,907 and US Patents 2,273,780, 2,375,853, 2,388,614, 2,454,547, 3,206,462, 2,261,002, 2,271,378, 3,874,870, 4,001,432, 3,929,990, 3,966,904, 4,005,193, 4,025,617, 4,025,627, 4,025,653, 4,026,945 and 4,027,020.

(11) polymers of poly(quaternary ammonium) composed of units of formula (VIII):



in which formula:

R_{18} , R_{19} , R_{20} and R_{21} , which are identical or different, represent a hydrogen atom or a methyl, ethyl, propyl, β -hydroxyethyl, β -hydroxypropyl or $-\text{CH}_2\text{CH}_2(\text{OCH}_2\text{CH}_2)_p\text{OH}$ radical,

where p is equal to 0 or to an integer of between 1 and 6, with the proviso that R_{18} , R_{19} , R_{20} and R_{21} do not simultaneously represent a hydrogen atom,

r and s , which are identical or different, are integers of between 1 and 6,

q is equal to 0 or to an integer of between 1 and 34,

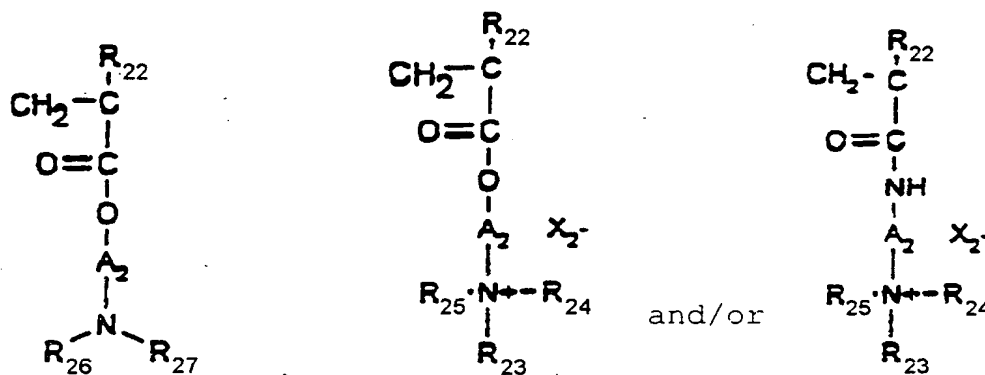
X denotes a halogen atom,

A denotes a radical from a dihalide or preferably represents $-\text{CH}_2-\text{CH}_2-\text{O}-\text{CH}_2-\text{CH}_2-$.

Such compounds are disclosed in particular in Patent Application EP-A-122,324.

Mention may be made among these, for example, of the products "Mirapol A 15", "Mirapol[®] AD1",
 5 "Mirapol[®] AZ1" and "Mirapol[®] 175", sold by the company Miranol.

(12) homopolymers or copolymers derived from acrylic or methacrylic acids and comprising units:



- 10 in which the R_{22} groups independently denote H or CH_3 ,
 the A_1 groups independently denote a linear or branched alkyl group of 1 to 6 carbon atoms or a hydroxyalkyl group of 1 to 4 carbon atoms,
 the R_{23} , R_{24} and R_{25} groups, which are
 15 identical or different, independently denote an alkyl group of 1 to 18 carbon atoms or a benzyl radical,
 the R_{26} and R_{27} groups represent a hydrogen atom or an alkyl group of 1 to 6 carbon atoms,
 X_2^- denotes an anion, for example methyl
 20 sulphate or halide, such as chloride or bromide.

The comonomer or comonomers which can be used in the preparation of the corresponding copolymers

belong to the family of acrylamides, methacrylamides, diacetone acrylamides, acrylamides and methacrylamides substituted at the nitrogen by lower alkyl, alkyl esters, of acrylic or methacrylic acids, vinyl-

5 pyrrolidone or vinyl esters.

(13) quaternary polymers of vinylpyrrolidone and vinylimidazole, such as, for example, the products sold under the names Luviquat[®] FC 905, FC 550 and FC 370 by the Company B.A.S.F.

10 (14) polyamines, such as Polyquart[®] H sold by Henkel, referenced under the name "Polyethylene Glycol (15) Tallow Polyamine" in the CTFA dictionary.

(15) crosslinked polymers of methacryloyloxyethyltrimethylammonium salt (for example chloride), such as the
15 polymers obtained by homopolymerization of dimethylaminoethyl methacrylate quaternized by methyl chloride or by copolymerization of acrylamide with dimethylaminoethyl methacrylate quaternized by methyl chloride, the homo- or copolymerization being followed
20 by a crosslinking by a compound possessing olefinic unsaturation, in particular methylenebisacrylamide or pentaerythritol methacrylate. Use may more particularly be made of a crosslinked acrylamide/methacryloyloxyethyltrimethylammonium chloride (20/80 by weight)

25 copolymer in the form of a dispersion comprising 50% by weight of the said copolymer in mineral oil. This dispersion is sold under the name of "Salcare[®] SC 92" by the Company Allied Colloids. Use may also be made of

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5 by the Company Allied Colloids.

According to the invention, use may more particularly be made of polymers chosen from Mirapol, the compound of formula (VII) in which R_{13} , R_{14} , R_{15} and R_{16} represent the methyl radical, A1 represents the radical of formula $-(CH_2)_3-$ and B1 represents the radical of formula $-(CH_2)_6-$ and X^- represents the chloride anion and the compound of formula (VII) in which R_{13} and R_{14} represent the ethyl radical, R_{15} and R_{16} represent the methyl radical, A1 and B1 represent the radical of formula $-(CH_2)_3-$ and X^- represents the bromide anion.

Among all the cationic polymers capable of being used in the context of the present invention, it is preferable to employ quaternary cellulose ether derivatives, such as the products sold under the name "JR[®] 400" by the Company Union Carbide Corporation, cyclopolymers, in particular the homopolymers of

diallyldimethylammonium chloride sold under the name "Merquat® 100" and its homologues of lower molecular weight, and the copolymers of diallyldimethylammonium chloride and of acrylamide sold under the names

- 5 "Merquat® 550" and "Merquat S" by the Company Merck, or cationic polysaccharides and more particularly the guar gum modified by 2,3-epoxypropyltrimethylammonium chloride sold under the name "Jaguar® C13S" by the Company Meyhall.

- 10 According to the invention, the cationic polymer or polymers can represent from 0.001% to 10% by weight, preferably from 0.005% to 5% by weight and more preferably still from 0.01 % to 3% by weight of the total weight of the final composition.

15 (ii) Amine-comprising silicones

(1) Amine-comprising silicones

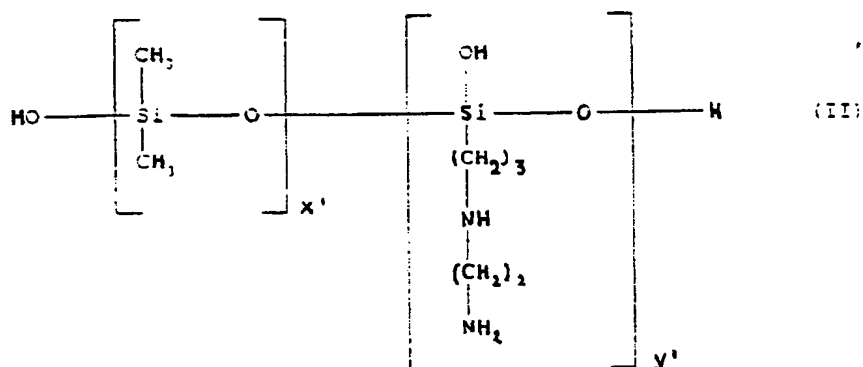
The amine-comprising silicone according to the invention have a weight-average molecular mass of between 11,000 and 25,000.

- 20 According to the invention, the term "amine-comprising silicone" denotes any silicone comprising at least one primary, secondary or tertiary amine or one quaternary ammonium group.

Mention may thus be made of:

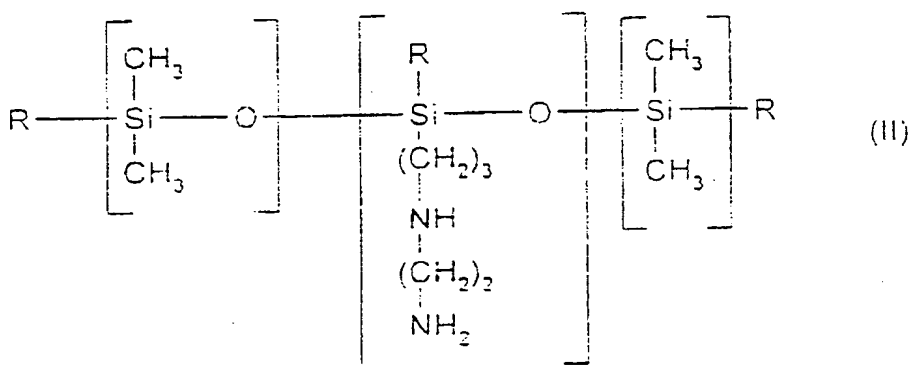
- 25 (a) polysiloxanes called "amodimethicone" in the CTFA dictionary (4th ed., 1991) and corresponding to the formula:

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in which x' and y' are integers which depend on the weight-average molecular mass, such that the said molecular mass is between 11,000 and 25,000,

- 5 (b) polysiloxanes called "amodimethicone" in the CTFA dictionary (7th ed., 1997) and corresponding to the formula:

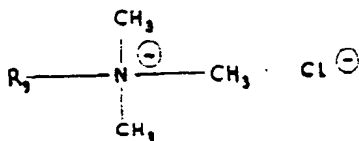


in which R denotes OH or methyl,

- 10 the weight-average molecular mass being between 11,000 and 25,000.

When these amine-comprising silicones are employed, a particularly advantageous embodiment is their use in the form of an oil-in-water emulsion. The
 15 surfactants can be of any nature but are preferably cationic and/or nonionic. Use may be made, for example,

of the product sold under the name "Silsoft TP515
Silicone Emulsion" by the Company OSI, which comprises,
in addition to amodimethicone, a cationic surfactant
comprising a mixture of products corresponding to the
5 formula



in which R₂ denotes alkenyl and/or alkyl radicals having
from 12 to 20 carbon atoms and preferably 16 carbon
atoms,

10 in combination with a nonionic surfactant known under
the name "C₁₁-C₁₅ Pareth-15", which is a mixture of
C₁₁-C₁₅ fatty alcohols polyoxyethylenated on average with
15 mol of ethylene oxide.

The mean size of the silicone particles in
15 the emulsion is generally between 30 nm and 2 microns,
preferably between 0.1 and 0.5 microns and more
particularly between 0.1 and 0.3 microns.

The weight-average molecular masses of these
amine-comprising silicones are measured by gel
20 permeation chromatography (GPC) at room temperature as
polystyrene equivalent. The columns used are μ styragel
columns. The eluent is THF and the flow rate is
1 ml/min. 200 μ l of a 0.5% by weight solution of
silicone in THF are injected. Detection is carried out
25 by refractrometry and UVmetry.

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The compositions in accordance with the invention comprise the amine-comprising silicones defined above at contents by weight which can be between 0.05% and 10%, preferably between 0.1% and 7% and more preferably still between 0.2% and 5% with respect to the total weight of the composition.

The vehicle, or carrier, of the detergent compositions according to the invention is preferably water or an aqueous/alcoholic solution of a lower alcohol, such as ethanol, isopropanol or butanol.

The detergent compositions according to the invention exhibit a final pH generally of between 3 and 10. This pH is preferably between 5 and 8. The adjustment of the pH to the desired value can be carried out conventionally by addition of a base (organic or inorganic) to the composition, for example aqueous ammonia, sodium hydroxide or a primary, secondary or tertiary (poly)amine, such as monoethanolamine, diethanolamine, triethanolamine, isopropanolamine or 1,3-propanediamine, or alternatively by addition of an acid, preferably a carboxylic acid, such as, for example, citric acid.

The detergent compositions according to the invention can, of course, additionally comprise all the usual adjuvants, such as, for example, fragrances, preservatives, sequestering agents, thickeners, softeners, foam-modifying agents, colorants, pearlescent agents, moisturizing agents, antidandruff

or antiseborrhoeic agents, vitamins, silicone or non-silicone sunscreens, suspending agents, proteins, silicones, ceramides, pseudoceramides, fatty acids with linear or branched C₁₆-C₄₀ chains, hydroxy acids,
5 electrolytes, polymers and others.

Of course, a person skilled in the art will take care to choose this or these possible additional compounds and/or their amounts so that the advantageous properties intrinsically attached to the combination
10 (washing base + cationic polymer + a specific silicone) in accordance with the invention are not, or not substantially, detrimentally affected by the envisaged addition or additions.

These compositions can be provided in the
15 form of more or less thickened liquids, of creams or of gel and they are mainly suitable for washing, caring for and/or styling the hair.

When the compositions in accordance with the invention are employed as conventional shampoos, they
20 are simply applied to wet hair and the foam generated by massaging or rubbing with the hands is then removed, after an optional period of rest, by rinsing with water, it being possible for the operation to be repeated one or more times.

25 Another subject-matter of the invention is a process for washing and for conditioning keratinous substances, such as the hair, which consists in applying, to the said wetted fibres, an effective

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As indicated above, the compositions in accordance with the invention confer on the hair, after rinsing, a notable styling effect which is expressed in particular by an ease of styling and of form retention, as well as a contribution of body and of lightness, which are markedly improved.

10 illustrating the invention will now be given.

EXAMPLE

15 the other comparative (composition B):

	<u>A</u> Invention	<u>B</u> Comparative
- Sodium lauryl ether sulphate (70/30 C12/C14) comprising 2.2 mol of ethylene oxide as an aqueous solution comprising 28% of AM (AM = active material)	14 g AM	14 g AM
- Miranol C2M Conc(*)	3.6 g AM	3.6 g AM
- Cationic polymer (**)	0.2 g	0.2 g
- Amine-comprising silicone according to the invention (***)	2.45 g AM	--
- Amine-comprising silicone (****)	--	2.45 g
- Mixture of 1-(hexadecyloxy)octadodecanol and of cetyl alcohol	2.5 g	2.5 g
- Monoisopropanolamide of copra acids	0.8 g	0.8 g
- Citric acid, q.s. pH	5	5
- Demineralized water, q.s.	100 g	100 g

(*) : Sodium cocoamidoethyl (N-hydroxyethyl-N-carboxymethyl)glycinate, sold by Rhône-Poulenc

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(**): Guar gum modified by 2,3-epoxypropyltrimethyl-ammonium chloride, sold under the name Jaguar[®] C13 S by the company Rhône-Poulenc

(***): Amodimethicone with a weight-average molecular
5 mass of approximately 15,000, sold as a cationic emulsion with an active material content of 35% under the name Silsoft[®] TP515 Silicone Emulsion" by the Company OSI.

(****): Amodimethicone with a weight-average molecular
10 mass of approximately 50,000, sold as a cationic emulsion with an active material content of 35% under the name Fluid DC 939 by the Company Dow Corning.

Shampooing is carried out by applying
15 approximately 12 g of the composition A to sensitive hair which has been wetted beforehand. The shampoo is made to foam and then copious rinsing is carried out with water.

The same procedure is carried out as above with the
20 comparative composition B.

A panel of experts evaluates the disentangling of the dried hair and the softness, the body, the feel and the sleekness of the dried hair.

All the experts indicate a marked improvement
25 in these properties for the hair treated with the composition A according to the invention.

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